

LOCKHEED MARTIN

August 24, 1995

Ms. Joan Kessner  
Bechtel Hanford, Inc.  
345 Hills  
P.O. Box 969  
Richland, WA 99352

RE: Log-in No.: L5087  
Quotation No.: Q400000-B  
SAF: B95-080  
Document File No.: 0810596  
WHC Document File No.: 256  
SDG No.: LK5074

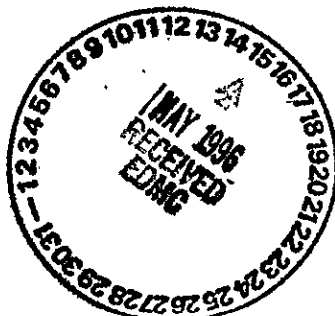


The attached data report contains the analytical results of samples that were submitted to Lockheed Analytical Services on August 10, 1995. The temperature of the cooler upon receipt was 5 °C. Sample containers received agree with the chain-of-custody documentation. Sample containers were received intact. Samples were received in time to meet the analytical holding time requirements.

The case narratives included in the following attachments provide a detailed description of all events that occurred during sample preparation, analysis, and data review specific to the samples and analytical methods requested.

A list of data qualifiers, chain-of-custody forms, sample receiving checklist, and log-in report are also enclosed representing the samples received within this group.

If you have any questions concerning the analysis or the data please call Kathleen Hall at (509) 943-4423.



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**Lockheed Analytical Services**

Log-in No.: L5087  
Quotation No.: Q400000-B  
SAF: B95-080  
Document File No.: 0810596  
WHC Document File No.: 256  
SDG No.: LK5074

Release of this data report has been authorized by the Laboratory Director or the Director's designee as evidenced by the following signature.

" I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manger or a designee, as verified by the following signature."

Sincerely,

  
Kathleen M. Hall  
Client Services Representative

cc: Client Services  
Document Control

000004

**CASE NARRATIVE  
INORGANIC NON METALS ANALYSES**

The routine calibration and quality control analyses performed for this batch include as applicable: instrument tune (ICP/MS only), initial and continuing calibration verification, initial and continuing calibration blanks, method blank(s), laboratory control sample(s), ICP interference check samples (ICP only), serial dilutions, analytical (post-digestion) spike samples, matrix spike (predigestion) sample(s), duplicate sample(s).

**Preparation and Analysis Requirements**

- One water sample was received for LK5087 and analyzed in batch 810 bh for selected analytes as requested on the chain of custody. Quality control analysis was performed on the following sample:

Client ID	LAL #		Method
BOGB71	L5087-3	MS, DUP	375.4 Sulfate

**Holding Time Requirements**

- All samples were analyzed within method-specific holding time.

**Method Blanks**

- The concentration levels of all the requested analytes in the method blank were below the reporting detection limits.

**Internal Quality Control**

- All Internal Quality Control were within acceptance limits.

Kay McCann  
Prepared By

August 16, 1995  
Date

000005

## **CASE NARRATIVE INORGANIC METALS ANALYSES**

The routine calibration and quality control analyses performed for this batch include as applicable: instrument tune (ICP/MS only), initial and continuing calibration verification, initial and continuing calibration blanks, method blank(s), laboratory control sample(s), ICP interference check samples (ICP only), serial dilutions, analytical (post-digestion) spike samples, matrix spike (predigestion) sample(s), duplicate sample(s).

### **Preparation and Analysis Requirements**

All samples were received on August 10, 1995. The samples were logged in as L5087 and were prepared and analyzed in batch 810 bh.

### **Holding Time Requirements**

- All samples were analyzed within the method-specific holding times.

### **Method Blanks**

- The concentration levels of all the requested analytes in the method blank were below the reporting detection limits.

### **Internal Quality Control**

- All Internal Quality Control were within acceptance limits.

Shellee McGrath  
Prepared By

August 21, 1995  
Date

000006

**CASE NARRATIVE  
ORGANIC ANALYSES**

**Analytical Method**

*Analytical Batch 081895-418.1*

**NOTE:** Sample GER-04-2002 (L5085-83) is the native sample used for the Matrix Spike (26392MS) and Matrix Spike Duplicate (26392MSD).

- The samples were extracted within the required holding time on August 17, 1995 and analyzed within the required holding time on August 18, 1995. All initial and continuing calibrations met criteria. Target compound TRPH was not detected in the Method Blank (MB). TRPH recovery was within QC limits in the MS, MSD, and Laboratory Control Sample (LCS). The Relative Percent Difference (RPD) between the MS and MSD recoveries was within QC limits.

Christine Davy  
Prepared By

August 24, 1995  
Date

000007

**CASE NARRATIVE  
RADIOCHEMICAL ANALYSES**

The routine calibration and quality control analyses performed for this batch include as applicable: instrument calibration, initial and continuing calibration verification, quench monitoring standards, instrument background analysis, method blanks, yield tracer, laboratory control samples, matrix spike samples, duplicate samples.

**NOTE:** Chemical recoveries and minimum detectable activities can be found on the preparation sheets and calculation sheets, respectively, on the attached raw data for each method.

**Holding Time Requirements**

All holding times were met.

**Analytical Method Strontium-90**

The strontium-90 analysis was performed using standard operating procedure, LAL-91-SOP-0196. The samples were analyzed in workgroup 26471. No problems were encountered during the analysis and all QC criteria were met. No re-analyses were performed.

Andrea Tippet  
Prepared By

August 24, 1995  
Date

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**Lockheed Analytical Services**  
**DATA QUALIFIERS FOR INORGANIC ANALYSES**

[Revised 08/28/92]

<b>For Use on the Analytical Data Reporting Forms</b>	
<b>B</b>	<i>For CLP Analyses Only</i> – Reported value is less than the contract required detection limit (CRDL) but greater than or equal to the instrument detection limit (IDL).
<b>C</b>	<i>For Routine, Non-CLP Analyses Only</i> – Any constituent that was also detected in the associated blank whose concentration was greater than the reporting detection limit (RDL).
<b>D</b>	Presence of high levels of interfering constituents required dilution of sample which increased the RDL by the dilution factor.
<b>E</b>	Estimated value due to presence of interference.
<b>H</b>	Sample analysis performed outside of method-or client-specified maximum holding time requirement.
<b>M</b>	<i>For CLP Analyses Only</i> – Duplicate injection precision criterion was not met.
<b>N</b>	Matrix spike recovery exceeded acceptance limits.
<b>S</b>	Reported value was determined from the method of standard addition.
<b>U</b>	<i>For CLP Reporting Only</i> – Constituent was analyzed for but not detected (sample quantitation must be corrected for dilution and percent moisture).
<b>W</b>	<i>For AAS Only</i> – Post-digestion spike for Furnace AAS did not meet acceptance criteria and sample absorbance is less than 50% of spike absorbance.
<b>X, Y, or Z</b>	Analyst-defined qualifier.
<b>*</b>	Relative percent difference (RPD) for duplicate analysis exceeded acceptance - limits.
<b>+</b>	Correlation coefficient (r) for the MSA is less than 0.995.
<b>For Use on the QC Data Reporting Forms</b>	
<b>a<sup>1</sup></b>	The spike recovery and/or RPD for matrix spike and matrix spike duplicates cannot be evaluated due to insufficient spiking level compared to the elevated sample analyte concentration.
<b>b<sup>1</sup></b>	The RPD cannot be computed because the sample and/or duplicate concentration was below the RDL.

<sup>1</sup> Used as footnote designations on the QC summary form.

000009

# Lockheed Analytical Services

## DATA QUALIFIERS FOR ORGANIC ANALYSES

[Revised 04/12/1995]

For Use On The Analytical Data Reporting Forms	
<b>A</b>	<i>For CLP analyses Only</i> – The TIC is a suspected aldol-condensation product.
<b>B</b>	Any constituent that was also detected in the associated blank whose concentration was greater than the practical or reporting detection limit (PQL or RDL).
<b>C</b>	Constituent confirmed by GC/MS analysis. <i>[pesticide/PCB analyses only]</i>
<b>D</b>	Constituent detected in the diluted sample. It also indicates that an accurate quantitation is not possible due to <u>surrogates</u> being diluted out of the samples during the course of the analysis.
<b>E</b>	Constituent concentration exceeded the calibration range.
<b>G</b>	The quantitation is not gasoline or diesel but believed to be some other combination of hydrocarbons.
<b>H</b>	Sample analysis performed outside of method- or client-specified maximum holding time requirement.
<b>J</b>	<i>Estimated value</i> – (1) constituent detected at a level less than the RDL or PQL and greater than or equal to the MDL; (2) estimated concentration for TICs ( <i>For CLP Reporting Only</i> ).
<b>N</b>	<i>For CLP Reporting Only</i> – Tentatively identified constituents (TICs) identified based on mass spectral library search.
<b>P</b>	<i>For CLP Reporting Only</i> – The percent difference between the concentrations detected on both GC columns was greater than 25 percent <i>[pesticide/PCB analyses only]</i> .
<b>U</b>	<i>For CLP Reporting Only</i> – Constituent was analyzed for but not detected (sample quantitation must be corrected for dilution and percent moisture).
<b>X, Y, or Z</b>	Analyst-defined qualifier.
<b>N/A</b> <b>(% Moisture)</b>	N/A in the % moisture cell indicates that data are reported on an "as received" basis. A value in the % moisture cell indicates that data are reported based on a "dry weight" basis.
For Use On The QC Data Reporting Forms	
<b>*</b>	QC data (i.e., percent recovery data for matrix spike, matrix spike duplicate, laboratory control standard, or surrogates; and RPD for matrix spike duplicate or unspiked duplicate) exceeded acceptance limits.
<b>a<sup>1</sup></b>	The spike recovery and/or RPD for matrix spike and matrix spike duplicates cannot be evaluated due to insufficient spiking level compared to the elevated sample analyte concentration.
<b>b<sup>1</sup></b>	The RPD cannot be computed because the sample and/or duplicate concentration was below the RDL.

<sup>1</sup> Used as footnote designations on the QC Summary Form.

000010

**Lockheed Analytical Services**  
**DATA QUALIFIERS FOR RADIOCHEMICAL ANALYSES**

[Revised 08/28/92]

<b>For Use on the Analytical Data Reporting Forms</b>	
<b>B</b>	Any constituent that was also detected in the associated blank whose concentration was greater than the reporting detection limit (RDL) and/or minimum detectable activity (MDA).
<b>C</b>	Presence of high TDS in sample required reduction of sample size which increased the MDA.
<b>D</b>	Constituent detected in the diluted sample.
<b>E</b>	Constituent concentration exceeded the calibration or attenuation curve range.
<b>F</b>	<i>For Alpha Spectrometry Only</i> -- FWHM exceeded acceptance limits.
<b>H</b>	Sample analysis performed outside of method-specified maximum holding time requirement.
<b>Y</b>	Chemical yield exceeded acceptance limits.
<b>For Use on the QC Data Reporting Forms</b>	
<b>*</b>	QC data (i.e., percent recovery data for laboratory control standard and matrix spike; and RPD for replicate analyses) exceeded acceptance limits.
<b>a<sup>1</sup></b>	The spike recovery and/or RPD for matrix spike and duplicates cannot be evaluated due to insufficient spiking level compared to the elevated sample analyte concentration.
<b>b<sup>1</sup></b>	The RPD cannot be computed because the sample and/or duplicate concentration was below the MDA.

<sup>1</sup> Used as foot note designations on the QC summary form.

LOCKHEED ANALYTICAL SERVICES  
LOGIN CHAIN OF CUSTODY REPORT (1n01)  
Aug 11 1995, 10:33 am

Login Number: L5087  
Account: 596 Bechtel Hanford, Inc. \* Richland, WA  
Project: BECHTEL-HANFORD Bechtel Hanford Project

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	Due PR Date
L5087-1 TEMP 5 Location: 157 Water 1 S SCREENING	BOGB71	08-AUG-95	10-AUG-95	25-AUG-95
Hold: 04-FEB-96				
L5087-2 TEMP 5 ICP=Ca, Mg ONLY Location: 157 Water 1 S 6010 ICP METALS	BOGB71	08-AUG-95	10-AUG-95	25-AUG-95
Hold: 04-FEB-96				
* L5087-3 TEMP 5 Location: 157 Water 1 S 375.4 SULFATE	BOGB71	08-AUG-95	10-AUG-95	25-AUG-95
Hold: 05-SEP-95				
L5087-4 TEMP 5 Location: 157 Water 1 S 418.1 TPH	BOGB71	08-AUG-95	10-AUG-95	25-AUG-95
Hold: 05-SEP-95				
L5087-5 TEMP 5 Location: 157	BOGB71	08-AUG-95	10-AUG-95	25-AUG-95
L5087-6 TEMP 5 Location: 157 Water 1 S SR-90 LAL-0196	BOGB71	08-AUG-95	10-AUG-95	25-AUG-95
Hold: 04-FEB-96				
L5087-7 TEMP 5 Location: 157	BOGB71	08-AUG-95	10-AUG-95	25-AUG-95
* L5087-8 TEMP 5 Location: 157	BOGB71	08-AUG-95	10-AUG-95	25-AUG-95
L5087-9 TEMP 5 Location: 157	BOGB71	08-AUG-95	10-AUG-95	25-AUG-95
L5087-10 Location: Water 1 S EDD - DISK DEL. Water 1 S GC2	REPORT TYPE	10-AUG-95	10-AUG-95	25-AUG-95

\* CHANGED 300.0 SULFATE TO 375.4 SULFATE  
PER K. HALL

000013

RC 8-11-95

0810596

LOCKHEED ANALYTICAL SERVICES  
LOGIN CHAIN OF CUSTODY REPORT (ln01)  
Aug 11 1995, 10:33 am

Login Number: L5087  
Account: 596 Bechtel Hanford, Inc. \* Richland, WA  
Project: BECHTEL-HANFORD Bechtel Hanford Project

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	Due PR Date
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Water	1	S INORG TYPE 2 RPT +		
Water	1	S RAD RPT TYPE 2		

Page 2

Signature: R. Callison

Date: 8-11-95

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0810596

LOCKHEED ANALYTICAL SERVICES  
 LOGIN CHAIN OF CUSTODY REPORT (ln01)  
 Aug 10 1995, 04:37 pm

Login Number: L5087  
 Account: 596 Bechtel Hanford, Inc. \* Richland, WA  
 Project: BECHTEL-HANFORD Bechtel Hanford Project

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	Due PR Date
L5087-1 TEMP 5 Location: 157 Water 1 S SCREENING	B0GB71	08-AUG-95	10-AUG-95	25-AUG-95
Hold:04-FEB-96				
L5087-2 TEMP 5 ICP=Ca,Mg ONLY Location: 157 Water 1 S 6010 ICP METALS	B0GB71	08-AUG-95	10-AUG-95	25-AUG-95
Hold:04-FEB-96				
L5087-3 TEMP 5 Location: 157 Water 1 S 300.0 SULFATE	B0GB71	08-AUG-95	10-AUG-95	25-AUG-95
Hold:05-SEP-95				
L5087-4 TEMP 5 Location: 157 Water 1 S 418.1 TPH	B0GB71	08-AUG-95	10-AUG-95	25-AUG-95
Hold:05-SEP-95				
L5087-5 TEMP 5 Location: 157	B0GB71	08-AUG-95	10-AUG-95	25-AUG-95
L5087-6 TEMP 5 Location: 157 Water 1 S SR-90 LAL-0196	B0GB71	08-AUG-95	10-AUG-95	25-AUG-95
Hold:04-FEB-96				
L5087-7 TEMP 5 Location: 157	B0GB71	08-AUG-95	10-AUG-95	25-AUG-95
L5087-8 TEMP 5 Location: 157	B0GB71	08-AUG-95	10-AUG-95	25-AUG-95
L5087-9 TEMP 5 Location: 157	B0GB71	08-AUG-95	10-AUG-95	25-AUG-95
L5087-10 Location: Water 1 S EDD - DISK DEL. Water 1 S GC2	REPORT TYPE	10-AUG-95	10-AUG-95	25-AUG-95

LOCKHEED ANALYTICAL SERVICES  
LOGIN CHAIN OF CUSTODY REPORT (ln01)  
Aug 10 1995, 04:37 pm

Login Number: L5087  
Account: 596 Bechtel Hanford, Inc. \* Richland, WA  
Project: BECHTEL-HANFORD Bechtel Hanford Project

Laboratory	Client	Collect	Receive	Due
Sample Number	Sample Number	Date	Date	PR Date

Water	1	S INORG TYPE 2 RPT +		
Water	1	S RAD RPT TYPE 2		

Page 2

Signature: Paul C. Davis

Date: 8-16-95

000016

0810596

Bechtel Hanford, Inc.

L5087

## CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround

☒ Priority  
☐ Normal

Collector K. J. Lee	Company Contact J.V. Borghese	Telephone (509) 372-9584
Project Designation 100-NR-2 Pre-Startup Performance Monitoring	Sampling Location 100 N	SAF No. B95-080
Ice Chest No. 6W5-133	Field Logbook No. EFL 1058	Method of Shipment Federal Express
Shipped To Lockheed	Offsite Property No. NA-84-15 W95-0-0204-45	Bill of Lading/Air Bill No. NA-84-15 2904637075
Possible Sample Hazards/Remarks		

Possible Sample Hazards/Remarks	Preservation	HNO <sub>3</sub>	Cool 4°C	H <sub>2</sub> SO <sub>4</sub>	HNO <sub>3</sub>	Cool 4°C					
	Type of Container	P/G	G	G	P/G	P/G					
	No. of Container(s)	1	1	2	4	1					
Special Handling and/or Storage Maintain samples between 2°C and 6°C.	Volume	500mL	250mL	1L	1L	20mL					
SAMPLE ANALYSIS		ICP Metals - Ca, Mg (Only)	Anions (IC) - SO <sub>4</sub>	TPH - Total	Sr-90	Activity Scan					

Sample No.	Matrix*	Date Sampled	Time Sampled									
BOGB71	W	8/8/95	1135	X	X	X	X	X				

CHAIN OF POSSESSION		Sign/Print Names		SPECIAL INSTRUCTIONS				Matrix*	
Relinquished By K. J. Lee	Date/Time 8/8/95 1340	Received By K. J. Lee	Date/Time 8-8-95					S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air DS = Drum Solids DL = Drum Liquids T = Tissue WI = Wipe L = Liquid V = Vegetation X = Other	
Relinquished By K. J. Lee	Date/Time 0800	Received By K. J. Lee	Date/Time 8-8-95						
Relinquished By K. J. Lee	Date/Time 8-9-95	Received By K. J. Lee	Date/Time 8-9-95						
Relinquished By K. J. Lee	Date/Time 8-9-95	Received By K. J. Lee	Date/Time 8-9-95						

LABORATORY SECTION	Received By K. J. Lee	Title Sample Custodian	Date/Time 8-10-95/0900
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

000001  
C 51C 54C

Environmental  
Restoration  
Contractor

**ERC Team**  
**Interoffice Memorandum**

Job No. 22192  
Written Response Required: NO  
CCN: N/A  
OU: 100-NR-2  
TSD: N/A  
ERA: N/A  
Subject Code: 5830

TO: W. S. Thompson N3-06      DATE: July 18, 1995  
COPIES: R. L. Biggerstaff H4-91      FROM: S. K. De Mers  
Radiological Controls  
T7-05/373-1913

SUBJECT: 1995 sampling 100-NR-2

There is no need to perform total activities prior to offsite shipment to NRC licensed labs of samples taken from the list of wells in Attachment 1.

All of the wells listed in the first attachment were reviewed for radiological content based on the previous 4 years of sampling data. No well listed has a  $\beta$  activity in excess of 100,000 pCi/l (<.1 uCi/sample based on a 1 liter sample size) nor any  $\alpha$  activity in excess of 10,000 pCi/l (<.01 uCi/l based on a 1 liter sample). All wells show activities < 2,000 pCi/gm (< 2 nCi/gm D.O.T. limit). The highest activity in recent samples is 3,260 pCi/l  $\beta$  and 5.2 pCi/l  $\alpha$ .

The remaining wells are in locations that may have a credible path whereby they could become contaminated at the above listed levels and therefor will need to have total activities run on them prior to shipment. Radiological monitoring will be required for the wells and seeps listed in Attachment 2.

Radiological monitoring during sampling will only be required for the wells in Attachment 1, if the wells are located in radiological areas or if the wells themselves are labeled with radiological stickers. Monitoring requirements for down hole work such as pump removal will be determined based on the history of each well on a case by case basis.

skd

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C. 510596

ATTACHMENT 1

**WELLS THAT DO NOT REQUIRE TOTAL ACTIVITIES**

Wells

199-N-14  
199-N-75  
199-N-29  
199-N-2  
199-N-3  
199-N-31  
199-N-46  
199-N-67  
- 199-N-76  
199-N-16  
199-N-17  
199-N-18  
199-N-19  
199-N-20  
199-N-21  
199-N-25  
199-N-26  
199-N-32  
199-N-50  
199-N-51  
199-N-54  
199-N-64  
199-N-66  
199-N-67  
199-N-70  
199-N-71  
199-N-73  
199-N-74  
199-N-75  
199-N-77  
199-N-80

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C 81C596

# SAMPLE CHECK-IN LIST

Date/Time Received: 8-10-95 / 0900 SDG#: not  
Work Order Number: not SAF #: 895-080  
Shipping Container ID: GWS 133 Chain of Custody #: not

1. Custody Seals on shipping container intact? Yes ☒ No ☐
2. Custody Seals dated and signed? Yes ☒ No ☐
3. Sample temperature 5°C
4. Vermiculite/packing materials is Wet ☐ Dry ☒
5. Each sample is in a plastic bag? Yes ☒ No ☐
6. Sample holding times exceeded? Yes ☒ No ☐

7. Samples have:  
☐ tape ☐ hazard labels  
☒ custody seals ☐ appropriate sample labels

8. Samples are:  
☒ in good condition ☐ leaking  
☐ broken ☐ have air bubbles

9. Is the information on the COC and Sample bottles in agreement?  
 Yes ☒ No ☐

Notes: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Sample Custodian/Laboratory: Paul Davis / Lock Haven Date: 8-10-95  
 Telephoned To: Keith Miller / H&L On 8-10-95 By Paul Davis  
8-10-95 pc

**Lot Number** L5087

For effective login review, at a minimum, five reports from the login process are required. These are the COC (or equivalent), the login COC report, the sample summary report, the sample receiving checklist, and the login quotation. Before beginning review, ensure that these five components are available. Jobs with single component samples, the sample summary report may be omitted.

<b><u>YES</u></b>	<b><u>NO</u></b>	<b><u>N/A</u></b>	<b><u>Comment</u></b>
-------------------	------------------	-------------------	-----------------------

- |   |   |   |   |   |
|---|---|---|---|---|
| 1. Are all sample ID's correct?                                       | X | — | — | — |
| 2. Are all samples present?   | X | — | — | — |
| 3. Are all matrices indicated correctly?                              | X | — | — | — |
| 4. Are all analyses on the COC logged in for the appropriate samples? | X | — | — | — |
| 5. Are all analyses logged in for the correct container?              | X | — | — | — |
| 6. Are samples logged in according to LAS batching procedures?        | X | — | — | — |

<u>YES</u>	<u>NO</u>	<u>N/A</u>	<u>Comment</u>
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1. Are the collect, receive, and due dates correct for every sample? X \_\_\_\_\_
2. Have all appropriate comments been indicated in the comment section? X \_\_\_\_\_

<u>YES</u>	<u>NO</u>	<u>N/A</u>	<u>Comment</u>
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1. Are all discrepancies between the COC and the login noted (if applicable)? X

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*Paula J. Davis*  
primary review signature

8-10-95  
date

secondary review signature

8-10-95  
date

C81C596

Lockheed Analytical Services  
Sample Receiving Checklist

Page 1 of

Client Name: *Westing House*

Job No. *L5087*

Cooler ID: *mt*

COOLER CONDITION UPON RECEIPT

Temperature of cooler upon receipt: *52*

temperature of temp. blank upon receipt:

	Yes	No	* Comments/Discrepancies
custody seals intact	<i>x</i>		
chain of custody present	<i>x</i>		
blue ice (or equiv.) present/frozen	<i>x</i>		
rad survey completed	<i>x</i>		

SAMPLE CONDITION UPON RECEIPT

	Yes	No	* Comments/Discrepancies
all bottles labeled	<i>x</i>		
samples intact	<i>x</i>		
proper container used for sample type	<i>x</i>		
sample volume sufficient for analysis	<i>x</i>		
proper pres. indicated on the COC	<i>x</i>		
VOA's contain headspace			
are samples bi-phasic (if so, indicate sample ID'S):		<i>n/a</i>	

MISCELLANEOUS ITEMS

	Yes	No	* Comments/Discrepancies
samples with short holding times		<i>x</i>	
samples to subcontract		<i>n/a</i>	

ADDITIONAL COMMENTS/DISCREPANCIES

Completed by / date: *Paul C. Davis 8-10-95*

Sent to the client (date/initials):

\*\* Client's signature upon receipt:

Notes: \* = contact the appropriate CSR of any discrepancies immediately upon receipt

\*\* = please review this information and return via facsimile to the appropriate CSR (702) 361-8146

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C81C54

Lockheed Analytical Laboratory  
SAMPLE SUMMARY REPORT (su02)  
Bechtel Hanford, Inc. \* Richland, WA

Client Sample Number	LAL Sample Number	SDG Number	Matrix	Method
BOGB71 -	L5087-1		Water	SCREENING -
	L5087-2		Water	6010 ICP METALS -
	L5087-3		Water	300.0 SULFATE -
	L5087-4		Water	418.1 TPH -
	L5087-6		Water	SR-90 LAL-0196 -
REPORT TYPE -	L5087-10		Water	EDD - DISK DEL. -
	L5087-10		Water	GC2
	L5087-10		Water	INORG TYPE 2 RPT
	L5087-10		Water	RAD RPT TYPE 2

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C.81059

## LOCKHEED ANALYTICAL SERVICES

## Sample Results

Client Sample ID: B0GB71	Date Collected: 08-AUG-95
Matrix: Water	Date Received: 10-AUG-95
Percent Solids: N/A	

Constituent	Units	Method	Result	Project Reporting Limit	Data Qualifier(s)	Date Analyzed	LAS Batch ID	LAS Sample ID
SULFATE	mg/L	375.4	130	50.	D(1:10)	11-AUG-95	26185	L5087-3

000024

# LOCKHEED ANALYTICAL SERVICES

## Sample Results

Client Sample ID: B0GB71	Date Collected: 08-AUG-95
Matrix: Water	Date Received: 10-AUG-95
Percent Solids: N/A	

Constituent	Units	Method	Result	Project Reporting Limit	Data Qual	Dilution	Date Analyzed	LAS Batch ID	LAS Sample ID
CALCIUM, TOTAL	mg/L	6010	150	0.032		1	17-AUG-95	26186	L5087-2
MAGNESIUM, TOTAL	mg/L	6010	26.	0.050		1	17-AUG-95	26186	L5087-2

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LOCKHEED ANALYTICAL SERVICES

RAD DATA REPORT (ra01)

Bechtel Hanford, Inc. \* Richland, WA

Bechtel Hanford Project (Project BECHTEL-HANFORD)

Client Sample ID: B0GB71

LAL Sample ID: L5087-6

Date Collected: 08-AUG-95

Date Received: 10-AUG-95

Matrix: Water

Login Number: L5087

Constituent	Analyzed	Batch	Activity	Error	MDA	DataQual	Units
Total radio-strontium	23-AUG-95	SR-90 LAL-0196_26471	970.	48.	0.75		pCi/L

# LOCKHEED ANALYTICAL SERVICES

TOTAL PETROLEUM HYDROCARBONS BY FTIR  
418.1 TPH

Client Sample ID: BOGB71  
Date Collected: 08-AUG-95  
Date Analyzed: 18-AUG-95  
Matrix: Water  
QC Group: 418.1 TPH\_26392

LAL Sample ID: L5087-4  
Date Received: 10-AUG-95  
Date Extracted: 17-AUG-95  
Analytical Batch ID: 081895-418.1  
Dilution Factor: 1

CONSTITUENT	RESULT mg/L	PRACTICAL	DATA
		QUANTITATION LIMIT mg/L	QUALIFIER(S)
TRPH	<1.00	1.00	

000036

Lockheed Environmental Systems & Technologies Co.  
Lockheed Analytical Services  
975 Kelly Johnson Drive Las Vegas, Nevada 89119-3705  
Telephone 702-361-0220 800-582-7605 Facsimile 702-361-8146

**LOCKHEED MARTIN**

August 24, 1995

Ms. Joan Kessner  
Bechtel Hanford, Inc.  
345 Hills  
P.O. Box 969  
Richland, WA 99352

RE: Log-in No.: L5074  
Quotation No.: Q400000-B  
SAF: B95-080  
Document File No.: 0809596  
WHC Document File No.: 256  
SDG No.: LK5074



The attached data report contains the analytical results of samples that were submitted to Lockheed Analytical Services on August 9, 1995. The temperature of the cooler upon receipt was 23°C. Sample containers received agree with the chain-of-custody documentation. Sample containers were received intact. Samples were received in time to meet the analytical holding time requirements.

The case narratives included in the following attachments provide a detailed description of all events that occurred during sample preparation, analysis, and data review specific to the samples and analytical methods requested.

A list of data qualifiers, chain-of-custody forms, sample receiving checklist, and log-in report are also enclosed representing the samples received within this group.

If you have any questions concerning the analysis or the data please call Kathleen Hall at (509) 943-4423.

000003

**Lockheed Analytical Services**

Log-in No.: L5074  
Quotation No.: Q400000-B  
SAF: B95-080  
Document File No.: 0809596  
WHC Document File No.: 256  
SDG No.: LK5074

Release of this data report has been authorized by the Laboratory Director or the Director's designee as evidenced by the following signature.

" I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."

Sincerely,

A handwritten signature in cursive script, appearing to read "Kathleen M. Hall for".

Kathleen M. Hall  
Client Services Representative

cc: Client Services  
Document Control

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## **CASE NARRATIVE RADIOCHEMICAL ANALYSES**

The routine calibration and quality control analyses performed for this batch include as applicable: instrument calibration, initial and continuing calibration verification, quench monitoring standards, instrument background analysis, method blanks, yield tracer, laboratory control samples, matrix spike samples, duplicate samples.

**NOTE:** Chemical recoveries and minimum detectable activities can be found on the preparation sheets and calculation sheets, respectively, on the attached raw data for each method.

### **Holding Time Requirements**

All holding times were met.

### **Analytical Method Gamma Spectrometry**

The gamma spectrometry analysis was performed using standard operating procedure (SOP), LAL-91-SOP-0063. The samples were analyzed in workgroup 26258. No problems were encountered during the analysis and all QC criteria were met. No re-analyses were performed.

### **Analytical Method Strontium-90**

The strontium-90 analysis was performed using SOP, LAL-91-SOP-0196. The samples were analyzed in workgroup 26471. No problems were encountered during the analysis and all QC criteria were met. No re-analyses were performed.

Andrea Tippet  
Prepared By

August 24, 1995  
Date

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LOCKHEED ANALYTICAL SERVICES  
LOGIN CHAIN OF CUSTODY REPORT (ln01)  
Aug 09 1995, 04:48 pm

OK MBK 8/11/95

Login Number: L5074  
Account: 596 Bechtel Hanford, Inc. \* Richland, WA  
Project: BECHTEL-HANFORD Bechtel Hanford Project

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	Due PR Date
L5074-1 TEMP 23 Location: RFG01-43 Water 1 S SCREENING	BOGBK3	04-AUG-95	09-AUG-95	24-AUG-95
Hold:31-JAN-96				
L5074-2 TEMP 23 Location: 157 Water 1 S GAMMA SPEC LAL-0063 Water 1 S SR-90 LAL-0196	BOGBK3	04-AUG-95	09-AUG-95	24-AUG-95
Hold:31-JAN-96				
Hold:31-JAN-96				
L5074-3 TEMP 23 Location: 157	BOGBK3	04-AUG-95	09-AUG-95	24-AUG-95
Hold:31-JAN-96				
L5074-4 TEMP 23 Location: 157	BOGBK3	04-AUG-95	09-AUG-95	24-AUG-95
Hold:31-JAN-96				
L5074-5 TEMP 23 Location: 157	BOGBK3	04-AUG-95	09-AUG-95	24-AUG-95
Hold:31-JAN-96				
L5074-6 Location: Water 1 S EDD - DISK DEL. Water 1 S RAD RPT TYPE 2	REPORT TYPE	09-AUG-95	09-AUG-95	24-AUG-95

Signature: Paul & Davis 000008  
Date: 8-09-95

0809546

Bechtel Hanford, Inc.

L5074

## CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround

☒ Priority☐ Normal

Collector Doug Bowers	Company Contact J.V. Borghese	Telephone (509) 372-9584
Project Designation 100-NR-2 Pre-Startup Performance Monitoring - Seeps	Sampling Location 100 N	SAF No. B95-080
Ice Chest No. CWS-046	Field Logbook No. EEL 1133	Method of Shipment Federal Express
Shipped To Lockheed	Offsite Property No. W95-0-0204-44	Bill of Lading/Air Bill No. 2904637005

Possible Sample Hazards/Remarks	Preservation					HNO <sub>3</sub>	Cool 4°C						
	Type of Container					P/G	P/G						
	No. of Container(s)					4	1						
Special Handling and/or Storage Maintain samples between 2°C and 6°C.	Volume					1L	20mL						
SAMPLE ANALYSIS						Sr-90 C0-60	Activity Scan						

Sample No.	Matrix*	Date Sampled	Time Sampled										
BOGBK3	W	8-4-95	1407				X	X					

CHAIN OF POSSESSION		Sign/Print Names		SPECIAL INSTRUCTIONS				Matrix*	
Relinquished By Doug Bowers	Date/Time 8-7-95/1038	Received By Paul C. Dunn	Date/Time 8-7-95	USE N5743 for shipping				S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air DS = Drum Solids DL = Drum Liquids T = Tissue WI = Wipe L = Liquid V = Vegetation X = Other	
Relinquished By Ere	Date/Time 0800	Received By	Date/Time						
Relinquished By B. White	Date/Time 8-8-95	Received By	Date/Time						
Relinquished By	Date/Time	Received By	Date/Time						

LABORATORY SECTION	Received By Paul C. Dunn	Title Sample Custodian	Date/Time 8-29-95/17:15
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

SAMPLE STATUS REPORT FOR N 5743. RAD SCREEN NS-13 TIME: 8/ 8/95 7:55  
DISPATCHED: 7/24/95 12:34 SAMPLE HAS NOT BEEN SLURPED  
RECEIVED: 8/ 7/95 13:22

EXT.	DETER.	RESULTS OR STATUS	OUT OF RANGE?	GOOD ANS?	CHARGE CODE
****	*****	*****	***	***	*****
4271	TOT-ACT	5.00000E 01 pCi/G	N	Y	XR5807

END OF REPORT

BOG-BK3  
BW  
8-8-95

000010

8-8-95

# SAMPLE CHECK-IN LIST

Date/Time Received: 8-9-95/0900

SDG#: \_\_\_\_\_

Work Order Number: \_\_\_\_\_

SAF #: 395-CF

Shipping Container ID: 114

Chain of Custody # \_\_\_\_\_

1. Custody Seals on shipping container intact? Yes ☒ No ☐
2. Custody Seals dated and signed? Yes ☒ No ☐
3. Sample temperature 23°C
4. Vermiculite/packing materials is Wet ☐ Dry ☒
5. Each sample is in a plastic bag? Yes ☒ No ☐
6. Sample holding times exceeded? Yes ☐ No ☒

7. Samples have:  
☐ tape ☐ hazard labels  
☒ custody seals ☐ appropriate sample labels

8. Samples are:  
☒ in good condition ☐ leaking  
☐ broken ☐ have air bubbles

9. Is the information on the COC and Sample bottles in agreement?

Yes ☒

No ☐

Notes: \_\_\_\_\_

Sample Custodian/Laboratory: Paul C. J. / Lock 4001 Date: 8-09-95

Telephoned To: Kathleen Hall On 8-09-95 By Paul C. J.

PCJ 8-09-95

# LOCKHEED MARTIN

## Sample Login Login Review Checklist

Lot Number L5074

The login review should be conducted by that person logging in the samples as well as a peer. Please use this checklist to ensure that such reviews occur in a uniform basis. Please sign and date below to verify that a login review has occurred. This checklist should be affixed to each login package prior to distribution.

For effective login review, at a minimum, five reports form the login process are required. These are the COC (or equivalent), the login COC report, the sample summary report, the sample receiving checklist, and the login quotation. Before beginning review, ensure that these five components are available. Jobs with single component samples, the sample summary report may be omitted.

### SAMPLE SUMMARY REPORT

	<u>YES</u>	<u>NO</u>	<u>N/A</u>	<u>Comment</u>
1. Are all sample ID's correct?	<u>X</u>	___	___	_____
2. Are all samples present?	<u>X</u>	___	___	_____
3. Are all matrices indicated correctly?	<u>X</u>	___	___	_____
4. Are all analyses on the COC logged in for the appropriate samples?	<u>X</u>	___	___	_____
5. Are all analyses logged in for the correct container?	<u>X</u>	___	___	_____
6. Are samples logged in according to LAS batching procedures?	<u>X</u>	___	___	_____

### LOGIN CHAIN OF CUSTODY

	<u>YES</u>	<u>NO</u>	<u>N/A</u>	<u>Comment</u>
1. Are the collect, receive, and due dates correct for every sample?	<u>X</u>	___	___	_____
2. Have all appropriate comments been indicated in the comment section?	<u>X</u>	___	___	_____

### SAMPLE RECEIVING CHECKLIST

	<u>YES</u>	<u>NO</u>	<u>N/A</u>	<u>Comment</u>
1. Are all discrepancies between the COC and the login noted (if applicable)?	___	___	<u>X</u>	_____

000012

Paul Davis  
primary review signature

8-09-95  
date

Paul Davis  
secondary review signature

8-09-95  
date

C809546

# LOCKHEED MARTIN

## Sample Login Login Review Checklist

Lot Number L5024

The login review should be conducted by that person logging in the samples as well as a peer. Please use this checklist to ensure that such reviews occur in a uniform basis. Please sign and date below to verify that a login review has occurred. This checklist should be affixed to each login package prior to distribution.

For effective login review, at a minimum, five reports from the login process are required. These are the COC (or equivalent), the login COC report, the sample summary report, the sample receiving checklist, and the login quotation. Before beginning review, ensure that these five components are available. Jobs with single component samples, the sample summary report may be omitted.

### SAMPLE SUMMARY REPORT

YES NO N/A Comment

- |   |          |             |             |   |
|---|----------|-------------|-------------|---|
| 1. Are all sample ID's correct?                                       | <u>X</u> | <u>    </u> | <u>    </u> | <u>                                </u> |
| 2. Are all samples present?   | <u>X</u> | <u>    </u> | <u>    </u> | <u>                                </u> |
| 3. Are all matrices indicated correctly?                              | <u>X</u> | <u>    </u> | <u>    </u> | <u>                                </u> |
| 4. Are all analyses on the COC logged in for the appropriate samples? | <u>X</u> | <u>    </u> | <u>    </u> | <u>                                </u> |
| 5. Are all analyses logged in for the correct container?              | <u>X</u> | <u>    </u> | <u>    </u> | <u>                                </u> |
| 6. Are samples logged in according to LAS batching procedures?        | <u>X</u> | <u>    </u> | <u>    </u> | <u>                                </u> |

### LOGIN CHAIN OF CUSTODY

YES NO N/A Comment

- |   |          |             |             |   |
|---|----------|-------------|-------------|---|
| 1. Are the collect, receive, and due dates correct for every sample?    | <u>X</u> | <u>    </u> | <u>    </u> | <u>                                </u> |
| 2. Have all appropriate comments been indicated in the comment section? | <u>X</u> | <u>    </u> | <u>    </u> | <u>                                </u> |

### SAMPLE RECEIVING CHECKLIST

YES NO N/A Comment

- |   |             |             |          |   |
|---|-------------|-------------|----------|---|
| 1. Are all discrepancies between the COC and the login noted (if applicable)? | <u>    </u> | <u>    </u> | <u>X</u> | <u>                                </u> |
|---|-------------|-------------|----------|---|

000012

Paul Davis  
primary review signature

8-09-95  
date

Paul Davis  
secondary review signature

8-09-95  
date

C809540

# Lockheed Analytical Services Sample Receiving Checklist

Page 1 of

Client Name: *Westinghouse - Hanford*

Job No. *LS074*

Cooler ID: *11/17*

## COOLER CONDITION UPON RECEIPT

Temperature of cooler upon receipt: *23°*

temperature of temp. blank upon receipt:

	Yes	No	* Comments/Discrepancies
custody seals intact	<i>X</i>		
chain of custody present	<i>X</i>		
blue ice (or equiv.) present/frozen		<i>X</i>	<i>no ice needed</i>
rad survey completed	<i>X</i>		

## SAMPLE CONDITION UPON RECEIPT

	Yes	No	* Comments/Discrepancies
all bottles labeled	<i>X</i>		
samples intact	<i>X</i>		
proper container used for sample type	<i>X</i>		
sample volume sufficient for analysis	<i>X</i>		
proper pres. indicated on the COC	<i>X</i>		
VOA's contain headspace			<i>not</i>
are samples bi-phasic (if so, indicate sample ID'S):			<i>N/A</i>

## MISCELLANEOUS ITEMS

	Yes	No	* Comments/Discrepancies
samples with short holding times		<i>X</i>	
samples to subcontract		<i>N/A</i>	

## ADDITIONAL COMMENTS/DISCREPANCIES

Completed by / date: *Paul C Davis 8-09-95*

Sent to the client (date/initials):

\*\* Client's signature upon receipt:

Notes: \* = contact the appropriate CSR of any discrepancies immediately upon receipt

\*\* = please review this information and return via facsimile to the appropriate CSR (702) 361-8146

Lockheed Analytical Laboratory  
SAMPLE SUMMARY REPORT (su02)  
Bechtel Hanford, Inc. \* Richland, WA

Client Sample Number	LAL Sample Number	SDG Number	Matrix	Method
BOGBK3	L5074-1 L5074-2 L5074-2		Water Water Water	SCREENING GAMMA SPEC LAL-0 SR-90 LAL-0196
REPORT TYPE	L5074-6 L5074-6		Water Water	EDD - DISK DEL. RAD RPT TYPE 2

000014

C.80959

LOCKHEED ANALYTICAL SERVICES

RAD DATA REPORT (ra01)

Bechtel Hanford, Inc. \* Richland, WA

Bechtel Hanford Project (Project BECHTEL-HANFORD)

Client Sample ID: BOGBK3

LAL Sample ID: L5074-2

Date Collected: 04-AUG-95

Date Received: 09-AUG-95

Matrix: Water

Login Number: L5074

Constituent	Analyzed	Batch	Activity	Error	MDA	DataQual	Units
Co-60	18-AUG-95	GAMMA SPEC LAL-0063_26258	-3.5	2.3	11.		pCi/L
Total radio-strontium	23-AUG-95	SR-90 LAL-0196_26471	6.90	0.83	0.81		pCi/L